

ITEM 05403.096202 M - SUPERPAVE HMA, UPSTATE HIGH VOLUME
9.5 mm F2

ITEM 05403.096212 M - PLANT PRODUCTION QUALITY ADJUSTMENT
to 05403.096202 M

ITEM 05403.126202 M - SUPERPAVE HMA, UPSTATE HIGH VOLUME
12.5 mm F2

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The requirements of Section 403 - Hot Mix Asphalt Concrete Pavement shall apply except as modified and/or revised below.

DESCRIPTION

This work shall consist of developing Hot Mix Asphalt pavement courses using the *SUPERPAVE* Mix Design procedure detailed in Materials Method 5.16, "*SUPERPAVE* Hot Mix Asphalt Mixture Design and Mixture Verification Procedures," in accordance with these specifications and in reasonable close conformity with the required lines, grades, thicknesses, and typical sections shown on the plans or established by the Engineer. This is a performance based specification in which the Contractor is responsible for compacting the pavement within a specified density range. Written instructions for determining pavement density and quality adjustment factors are available from the Regional Materials Engineer or the Director, Materials Bureau.

MATERIALS

The materials and composition for these mixtures shall meet the requirements specified in Subsection 403-2 Materials, except as noted herein. The specific Performance Graded Binder and the Design Estimated Traffic in 80 kN ESALs will be specified by a special note in the Contract Proposal.

Subsection 401-2.02 Composition of Mixtures shall be deleted and replaced with the following:

"Formulate and submit to the Regional Materials Engineer, a *SUPERPAVE* Mix Design that satisfies the design control points listed in Table 2 - Design Control Points and does not pass through the restricted zone listed in Table 3 - Restricted Zone of Materials Method 5.16, based on the specified nominal maximum aggregate size.

If for any reason, a change in gradation or materials occurs, prepare a separate job mix formula and *SUPERPAVE* mixture design to fit each change in material or gradation. Changes in Performance Graded Binder content can be made by the Regional Director or his representative providing the resultant mixture has properties within the specified mechanical and volumetric properties.

The mixtures shall be produced, delivered to the work site, and incorporated into the work within 10°C of the temperature specified by the Contractor but within the mixing and compaction range of 120°C and 165°C. Additionally, the Performance Graded Binder shall be introduced into the pugmill at a temperature compatible with that of the aggregate as determined by the Regional Director or his

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representative, between the limits of 110°C and 175°C.

The aggregates shall be those approved for use by the approved job mix formula and will be accepted at the plant site. The Performance Graded Binder will be conditionally accepted at the supplier's source and at the plant on the basis of certification. Samples taken at the plant will be tested by the Department to determine specification compliance.

Subsection 401-2.03A. Coarse Aggregate and 401-2.03B. Blending shall be deleted and replaced with the following:

"A. Coarse Aggregates. For 12.5 mm F2 and 9.5 mm F2 top course HMA mixtures shall be from an approved source, meeting one of the following descriptions:

1. Limestone having an acid insoluble residue content of not less than 20.0%, excluding particles of chert and similar siliceous rocks.
2. Dolomite having an acid insoluble residue content of not less than 17.0%, excluding particles of chert and similar siliceous rocks.
3. Granite, chert, or traprock non-carbonate materials. Non-carbonate particles are defined as having a minimum acid insoluble residue content of 80.0%.
4. Manufactured blend of the following types of materials: limestone, dolomite (excluding Wappinger dolomite, as defined by the Department), granite, chert, or traprock, meeting the following requirements:

12.5 mm Nominal Maximum Size Aggregate Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 20.0% of plus 9.5 mm particles must be non-carbonate.

9.5 mm Nominal Maximum Size Aggregate Mixes - Non-carbonate plus 3.2 mm particles must comprise a minimum of 10.0% of the total aggregate (by weight with adjustments to equivalent volumes for materials of different specific gravities). Additionally, a minimum of 20.0% of plus 4.75 mm particles must be non-carbonate.

Non-carbonate particles are defined as having a minimum acid insoluble residue content of 80.0%.

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B. Blending. Where coarse aggregates for these mixes are from more than one source or of more than one type of material, they shall be proportioned and blended to provide a uniform mixture.”

has been
Disapproved

Subsection 401-2.05 Bituminous Materials shall be deleted and replaced with the following:

due to restrictive

“The Performance Graded Binder (PGB) used in the production of these mixes shall be defined by AASHTO Provisional Standard MRL – Standard Specification for Performance Graded Asphalt Binder.

aggregate requirements on
order of the Chief Engineer

Acceptance of the PGB is based on the primary source appearing on the Department’s Approved List for Bituminous Material Primary Sources, A. Performance Graded Binders for Paving. Acceptance of the PGB is contingent upon satisfactory test results from samples taken, as required by the Department’s procedural directives, at the location where the material is incorporated into the work. A primary source is defined as a firm that samples, tests, and certifies by Production Lot that the PGB is in conformance with the specifications. The procedural directives for sampling, testing, and certifying the PGB, and for achieving and maintaining approved list status, are available from the Materials Bureau.

The PGB shall not be delivered to the HMA Production Facility at a temperature in excess of 175°C.”

CONSTRUCTION DETAILS

The details of §401-3 Construction Details shall apply except as modified below: Add the following to the end of Subsection 401-3.02 Bituminous Mixing Plant A. Requirements for All Plants No.

11:

“Y. Gyratory Compactor - A power driven gyratory compactor capable of maintaining an angle of gyration of $1.25^\circ \pm 0.02^\circ$, a speed of gyration of $30.0 \text{ rpm} \pm 0.5 \text{ rpm}$, and a consolidation pressure of $600 \text{ k Pa} \pm 10\%$ for gyrations zero to five and $\pm 3\%$ for gyrations six and greater. The make and model of the gyratory compactor supplied must be approved by the Director, Materials Bureau.

Z. Gyratory Specimen Mold Assembly - The specimen mold assembly consisting of the mold $150.00 \text{ mm} + 0.00 \text{ mm}$ and $- 0.01 \text{ mm}$, base plate and top plate (if required). The minimum height of the mold is 250.00 mm . A minimum of 4 mold assemblies and an adequate supply of 150.00 mm paper discs shall be provided.

AA. Gyratory Specimen Extractor - A simple means of specimen extraction from the gyratory molds

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shall be supplied.

BB. Oven - A thermostatically controlled convection type oven having a minimum capacity of 0.15 cubic meters shall be supplied to preheat the SUPERPAVE Gyroatory Compactor mold assemblies and asphalt mix samples. The oven shall have a controlled temperature range up to 190°C with a ± 3°C accuracy throughout the range.

CC. Kraft Paper - 23 kg medium weight, 915 mm width.

DD. Sheet Rock Taping Knives (minimum 2) - 254 mm length.

EE. Aging Pans (minimum 4) - 457 mm x 457 mm x 38 mm H galvanized iron pans.

FF. Miscellaneous Pans (minimum 4) - 394 mm x 280 mm x 51 mm H aluminum pans.

GG. Screen trays (1 each) - 457 mm x 660 mm to include the following: 2.36 mm, 1.18 mm, 0.60 mm, 0.30 mm, 0.15 mm, 0.075 mm”

Add the following to the end of §401-3 Construction Details:

“**Test Section.** Prior to paving operations for this item, construct a test section on the project site at a location approved by the Engineer, using the same equipment and procedures to be used in the construction of the remainder of the course being laid, and **stop paving** unless the Paving Option below is selected.

The amount of mixture prepared according to the job mix formula should be sufficient to construct a test section 500 centerline meters, the full width of pavement, and shall be of the same depth specified for the construction of the course which it represents. Routine paving will only begin after a Project Target Density (PTD) has been established by the Regional Materials Engineer based on testing of the pavement cores. The test section is for determining the PTD for this item and for calibration of the nuclear density gauge. The PTD will be established within one business day of the delivery of the four cores, the two loose mix samples, and the four nuclear density readings.

Note. Routine paving will only begin after a Project Target Density (PTD) has been established by the Regional Materials Engineer. Also, construction of a test section will not begin unless both a nuclear density gauge and an operator are present.

Use the first 150 linear meters of the test section to stabilize the paving operation. The remainder of the

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length will be used to determine the PTD. During construction of the test section, take two loose mix samples, in accordance with AASHTO T168. These samples will represent the material placed on this test section. At the conclusion of the test section, take four cores from the test section (exclude initial 150 meters) at locations randomly selected by the Engineer in accordance with Materials Procedure 96-01M. If coring is performed the same day as placement, cool the pavement so that the core sample is not damaged during coring. At each core location, take density readings with a nuclear density gauge(s). A nuclear density reading at each core location will be the average of the four measurements taken at 90°. Only gauge(s) calibrated during the construction of the test section will be allowed to be used during normal paving operations. Deliver the four cores, the two loose mix samples, and the four nuclear density readings to the Department Regional Laboratory. With the nuclear density readings, include gauge model number and serial number for each gauge calibrated on the test section. The Regional Materials Engineer will use the test section cores and nuclear gauge readings to establish the PTD.

Core Testing Option. The Contractor may elect to test the cores procured under this specification. The testing will be performed under provisions of Materials Procedure NY 98-01M, "Procedure for Testing Cores Taken from All Hot Mix Asphalt (HMA) Performance-Related Specifications". If the Contractor elects to test the cores, the Engineer will define one additional core from two of the sublots within 0.3 m from the original core location, at the same offset, and secure them using the "Security Procedure".

Paving Option. Paving may continue after completion of the test section using an interim PTD determined in accordance with Materials Procedure 96-01M, "Nuclear Gauge Density Data Collection and Determination of Pavement Core Locations for Rut Avoidance Asphalt Concrete". If the average density of the four cores taken on the test section is not between 92-97% of the mixture's maximum theoretical density, payment adjustments will be applied to any material placed after the test section and before the Project Target Density (PTD) has been determined by the Regional Materials Engineer. The payment adjustment will be made according to Table 1 - Density Quality Adjustment Factors."

Add the following to the end of Subsection 401-3.06 Rollers.

"The compaction equipment shall conform to the requirements of this Subsection. Control the operation of the rollers during the placement of these items including the speed, the amplitude settings, the vibration frequency, and the weight of the rollers."

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Subsection 401-3.12 Compaction shall be deleted and replaced with the following:

“Immediately after the hot mix asphalt (HMA) has been spread, struck off and surface irregularities adjusted, compact the mix by rolling thoroughly and uniformly. Roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking or shoving. Initially roll the pavement with the roller traveling parallel to the centerline of the pavement beginning at the low edge and working toward the super-elevated edge.

Use a nuclear density gauge to monitor and record the pavement density in accordance with this section and Materials Procedure 96-01M. “Nuclear Gauge Density Data Collection and Determination of Pavement Core Locations for Rut Avoidance Asphalt Concrete.” The nuclear density gauge should consist of a radioactive source, scaler and other basic components housed in a single backscatter unit. The gauge must be operated by personnel trained in the principles of nuclear testing and safety practices. Only gauge(s) calibrated during the construction of the test section will be used during normal paving operation. If another nuclear gauge is to be used, a new test section must be constructed to calibrate it and to establish a new PTD.

Compact the pavement sufficiently to achieve a minimum density of 96% of the PTD in a single test location and 98% of the PTD calculated as a moving average of the last 10 test locations as determined by a nuclear density gauge. Take nuclear gauge readings at each site, randomly selected by the Engineer, approximately every 60 meters along the length of the pavement for each pass of the paver and record them on a BR340M.

If the average of 4 nuclear density gauge measurements taken at 90° angles over two consecutive locations falls below 96% of the PTD or if the moving average of the last 10 nuclear gauge test sites falls below 98% of the PTD, stop routine paving operations and construct a new test section. Normal production will only resume after establishing a new PTD.

Placement and compaction on shoulders, ramps, maintenance widenings, crossovers, and bridges will be deemed satisfactory by the Engineer when the procedures used in these areas are the same as those used on the mainline pavement sections. If shoulders show signs of distress at this level of compaction decrease the compactive effort until no damage occurs to the shoulder or subbase. Nuclear gauge(s) used to monitor the mainline paving should be used to monitor the above referenced areas to insure that the pavement density is between 92% to 97% of the mixture’s average daily maximum theoretical density if the shoulder subbase is structurally sufficient to sustain this level of compaction.

The Engineer may require additional daily density verification consisting of four cores, nuclear density readings at each core location, and two loose mix samples on any day during routine production with adequate notice. Deliver the cores, nuclear density readings, and loose mix samples to the Department

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due to restrictive
aggregate requirements on
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The following guidelines will be used by the EIC to determine when additional pavement cores should be required during routine paving.

1. Material Subject to Payment Adjustment.

- a. Pavement density monitoring was not performed in accordance with the specification requirements. This would include, but is not limited to: not taking the required number of density readings (either at a specific location or at the required frequency), beginning to pave without a nuclear density gauge on site, and continuing to pave after the only calibrated nuclear density gauge on site breaks down.
- b. There is a reason to believe that the nuclear density gauge readings do not accurately represent the actual in-place density of the pavement.

If the average density of the four cores is not between 92% and 97% of the mixture's average daily maximum theoretical density, a payment adjustment will be applied to the material placed on the day represented by the pavement cores. The payment adjustment will be made according to Table 1 - Density Quality Adjustment Factors.

2. Material Not Subject to Payment Adjustment.

There are situations when the EIC should require pavement cores to monitor the Project Target Density (PTD) being used on the project. These situations include, but are not limited to the following: new mix design or supplier, change of existing pavement being overlaid, change of paving equipment (i.e., paver or rollers) being used, and excessive plant variation. In these situations the nuclear density gauge tests will be used for acceptance. However, a new PTD will be established if different from the original PTD.

When the rolling operation is complete there should be no visible shallow ruts, ridges, other roller marks, or irregularities in the pavement. If these imperfections are present, correct the imperfections or relay the pavement to the satisfaction of the Engineer. Perform all corrective work at no additional cost to the Department.

Correct at once any displacement occurring as a result of reversing the direction of the roller, or from other causes, by the use of rakes and addition of fresh mixture as required. Exercise care in rolling not to displace the line and grade of the edges of the bituminous mixture. To prevent adhesion of the mixture to the drum(s) of the roller, properly moisten the drum(s) with water, or water mixed with small quantities of detergent or other Department approved asphalt release compounds. If a pneumatic tire roller is used, the pneumatic drive wheels may be coated with a fine mist spray of fuel oil or other similar materials to prevent pneumatic tire pickup. In all instances, protect the surface of the pavement from drippings of fuel oil or any other solvents used in paving, compaction or cleaning operations.

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Unless otherwise directed by the Engineer, compact the longitudinal joint by using one of the pneumatic drive wheels to overlap the joint in two (2) passes with the drum operating static where vibratory rollers having pneumatic drive wheels are used. If dual vibrating drum rollers are used compact the joint by overlapping the joints in two (2) passes with both drums operating static.

Along forms, curbs, headers, walls and other areas not accessible to the rollers, compact the mix thoroughly with mechanical tampers as directed by the Engineer. On depressed areas, a trench roller or small vibratory roller approved by the Engineer may be used. Cleated compression strips also may be used under the roller to transmit compression to the depressed area.

Remove any mixture that becomes loose and broken, mixed with dirt, or is in any way defective and replace with fresh hot mixture and compact to conform with the surrounding area. Correct any area showing an excess or deficiency of bituminous materials to the satisfaction of the Engineer.

If vibratory compaction equipment is used, the Contractor assumes full responsibility for the cost repairing all damage which may occur to highway components and adjacent property including buried utility and service facilities.

When multiple paving operations are utilized with material production from a single plant each paving operation will be evaluated separately.

Routine paving operations will not begin unless both a project calibrated nuclear density gauge and an operator are present.

Backfill all core holes, with a similar HMA material as was cored, as soon as possible after coring, using a procedure approved by the Engineer.”

METHOD OF MEASUREMENT

The provisions of §401-4, §402-4 and §403-4, Method of Measurement shall apply including the following:

“The Department will test the cores from a test section or from any day the Engineer requests cores. If paving is continued using an interim PTD immediately after the conclusion of a test section, or if the Engineer requests additional cores on any day after the first day, full payment will be made if the average density of the four cores is between 92% and 97% of the mixture's average daily maximum theoretical density. If the average density fails to meet this limit, **the quantity placed** will be adjusted according to Table 1 - Density Quality Adjustment Factors shown below:

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Table 1 - Density Quality Adjustment Factors

Average Core Density	Quality Adjustment Factor
91.0 ≤ Density < 92.0	0.95
90.0 ≤ Density < 91.0	0.90
88.0 ≤ Density < 90.0	0.85
< 88.0	0.60*

* The lot shall be evaluated by the Department to determine if it may remain in-place. The type of material produced (i.e., binder, top), the layer in which it was used, and the location of use (i.e., mainline or a non-critical area) will be primary considerations in the determination of whether the HMA can be left in-place. If the HMA cannot be left in-place it will be removed at no cost to the Department. However, if the Department determines that the HMA can be left in-place, the Quality Payment Adjustment will be calculated using a QAF of 0.60.

The quantity of the material subject to payment adjustments will be determined from typical sections shown in the plans. The payment adjustments will be applied to material placed on mainline but not shoulders, ramps, maintenance widenings and crossovers, and bridges.”

BASIS OF PAYMENT

The provisions of subsection 403-5 Basis of Payment shall apply including the following:

“The unit bid price also includes the cost of all necessary equipment, labor and materials required in construction of the test sections, nuclear density testing, obtaining the pavement cores, filling all core holes with asphalt concrete and compacting these core holes satisfactorily to the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
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05403.126202 M	<i>SUPERPAVE</i> HMA, UPSTATE HIGH VOLUME 12.5 mm F2	Metric Ton
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